A Demonstration of the Final Approach Runway Occupancy Signal (FAROS)

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Introduction

- Background
- Operational Concept
- System Description
- System Installation
- Demonstration Activities
- Future Work

FAROS Background

- NTSB safety recommendation (July 2000) A-00-66:
  - "Require, at all airports with scheduled passenger service, a ground movement safety system ……provide a direct warning capability to flight crews."
- 2002 – 2004 FAA Runway Safety Blueprint
  - "…develop and evaluate a visual signal that provides direct warning to flight crews on final approach when the runway is occupied;"
- At present, no automated system exists to directly warn pilots on approach of occupied runway.

Project Background

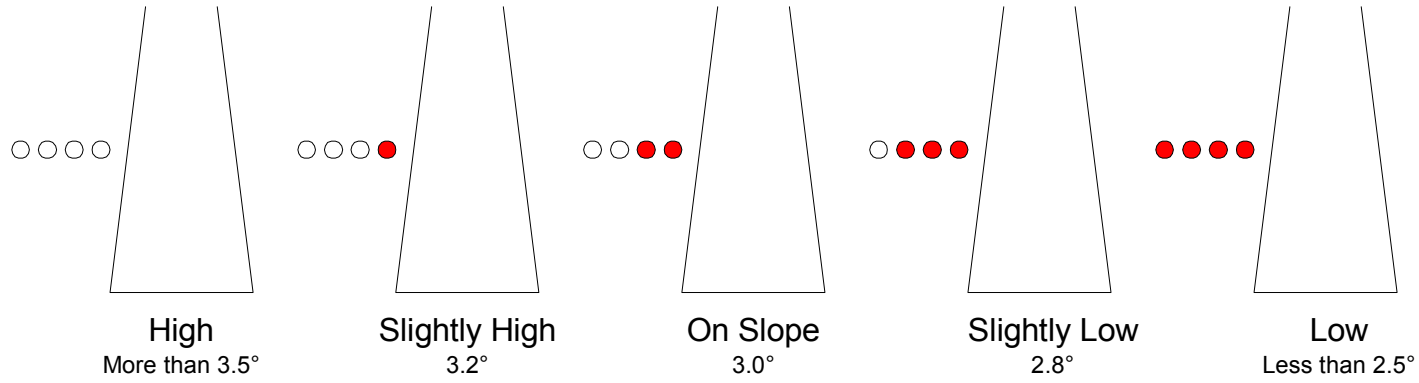
- FAA's Joint Safety Implementation Team (JSIT) suggested utilizing Precision Approach Path Indicator (PAPI) lights as a means to notify pilots on approach that the runway is occupied
- FPAPI implementation of FAROS concept explored at Long Beach Airport in September, 2002

Operational Concept

- The FPAPI system:
  - Provides visual indication of runway occupancy by flashing the PAPI lights
  - Acts automatically based on surface surveillance sensor inputs
  - Utilizes activation zone concept to decrease overall system costs
- The FPAPI acts as a stand alone safety enhancement, providing an additional data point to the pilot on approach

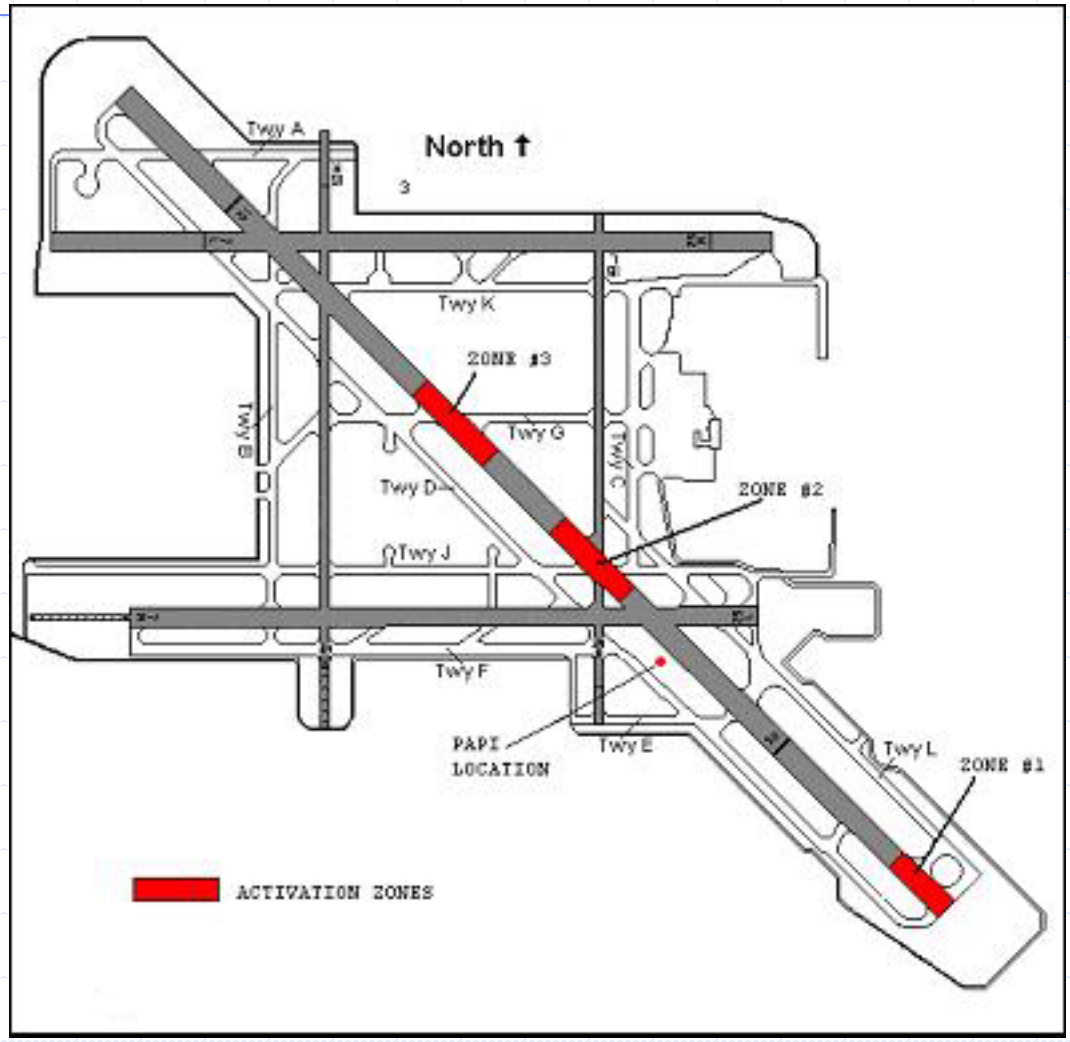
System Description

- PAPI provides precision glide slope information
- Inductive loop sensors in taxiway and runway surfaces act as surveillance source
- Flash control unit flashes PAPI lights when activation zones are occupied



Colors provide glide slope information.
Lights flashed as a unit to indicate runway occupancy status.

Activation Zones at LGB



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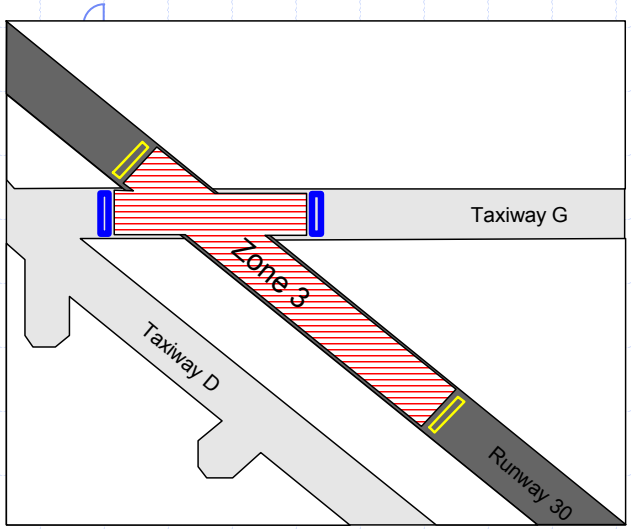
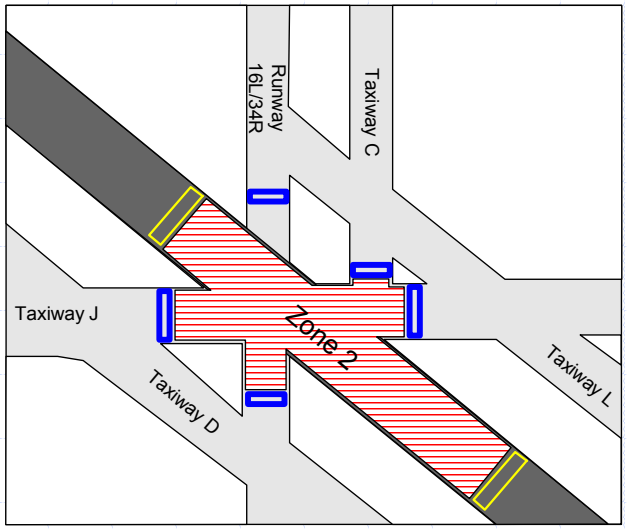
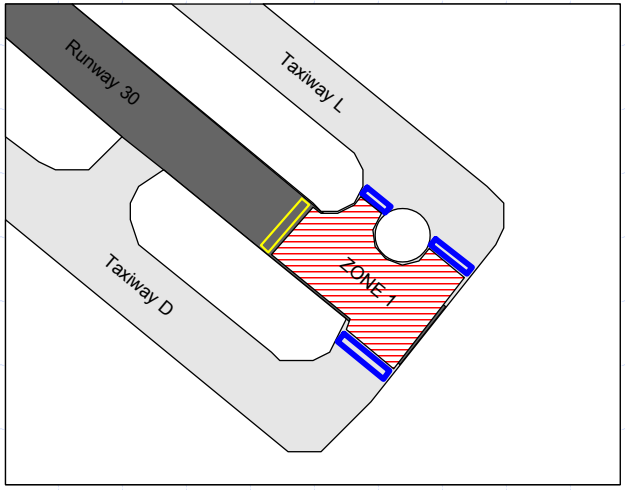






System Installation

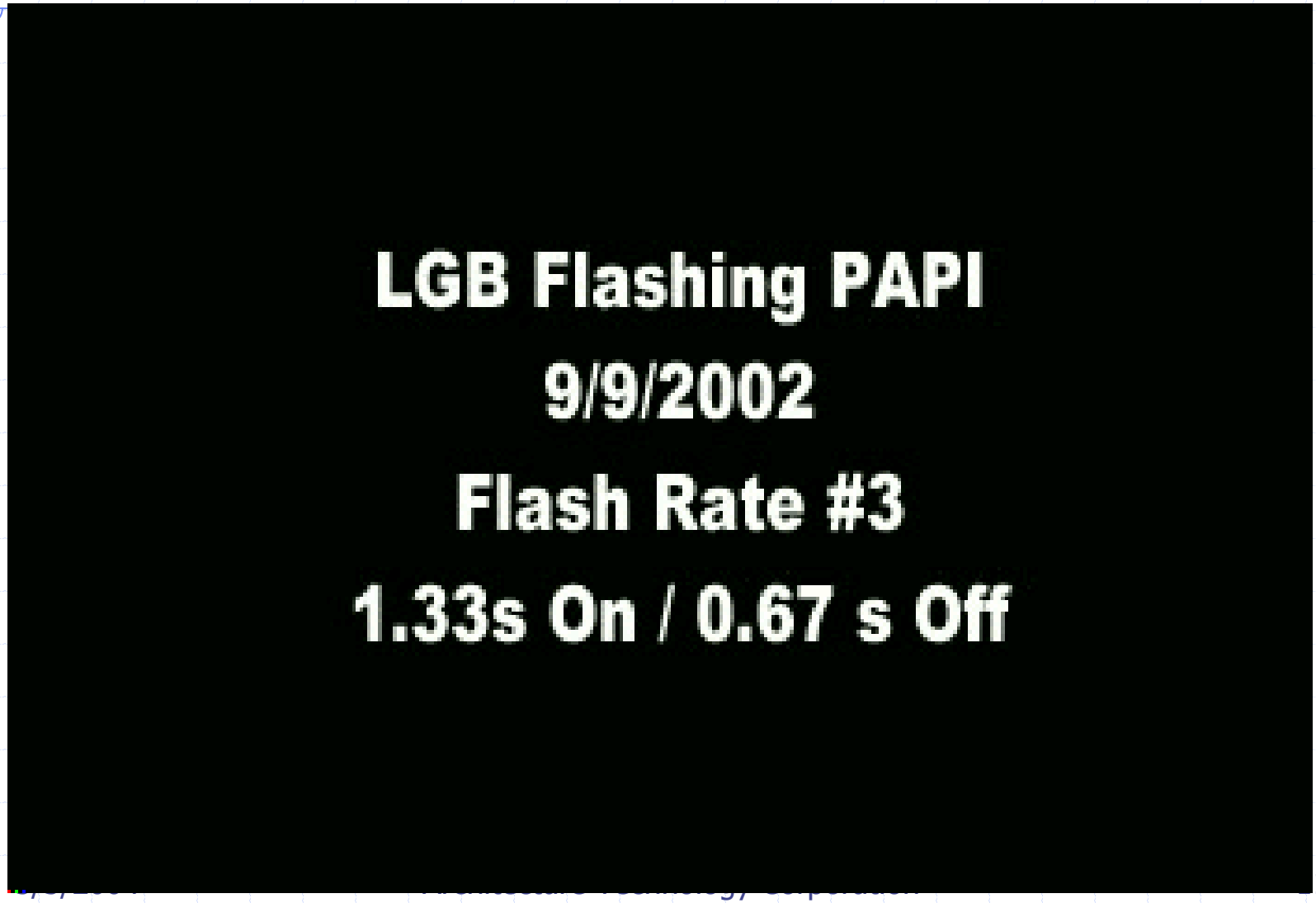
- Second PAPI system installed:
  - Leave operational system intact and available for use
  - Provide platform for "hooded" testing

Demonstration Activities

- September 2002
- Activation scenarios using:
  - Demonstration aircraft with volunteer pilot observers
  - Activation vehicle (day) or aircraft (night)
- Coordination with LGB ATC for sequencing into flight pattern and surface movement

- 26 observers
- Surveys given on site
- Positive and encouraging responses

Demonstration Video



Current and Future Work

- FAROS Research Management Plan (RMP) is in progress within the FAA
  - Modeling and Simulation activities completed
  - Operational Evaluation activities at LGB scheduled for FY-05
  - Extensive pilot familiarization program planned prior to evaluation period
- Following RMP evaluation, determination will be made within FAA whether to continue pursuit of concept
- Goal to provide FAROS concept as tool available for implementation within the National Airspace System

Conclusion

- Demonstration of FAROS concept utilizing FPAPI system at LGB
- Successful and encouraging
- FAA continuing research of concept through RMP process
- Operational Evaluation planned at LGB for FY-05

Discussion/Questions?

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